NOTES TO ARCHITECT

SECTION 07510 - BUILT-UP BITUMINOUS ROOFING

PART I - GENERAL

1.01 GENERAL CONDITIONS

As specified in Section 00700.

Add to, delete from or modify this section to fit your project.

1.02 COORDINATION WITH OTHER SECTIONS

A. Coordinate installation of metal edging, pitch pocket pans, gutters, counterflashing, etc. with SHEET METAL Section.

B. Coordinate installation of vent pipe flashing and roof drains with PLUMBING Section.

C. Coordinate installation of wood strips related to roofing with CONCRETE and CARPENTRY AND RELATED WORK Sections.

Be sure to call for coordination with this section in your SHEET METAL, PLUMBING, CONCRETE, and CARPENTRY AND RELATED WORK Sections.

1.03 GENERAL REQUIREMENTS

A. The Contractor shall visit the job site to verify the site conditions and dimensions prior to submitting his bid.

Delete this paragraph for new work.

B. The roofing operations shall be so coordinated with appurtenant work such as sheet metal work that roof surfacing operations once started shall be continuous to completion.

C. The roofing contractor shall be an approved applicator of the manufacturer whose roofing system he proposes to apply and his men shall have been instructed by that manufacturer (or their representative or independent roofing auditor / inspector) in the proper application of his system.

D. The Roofing Manufacturer's Representative and their independent roofing auditor/inspector (where applicable) shall be competent, thoroughly trained and experienced in the work and shall be completely familiar with the products, equipment and the specified requirements and methods needed for the proper installation of the roofing membrane and flashings.

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E. The Contractor, Roofer and the authorized Roofing Manufacturer's Representative and/or their independent roofing auditor/inspector shall attend a pre-construction conference to review the preparation and installation requirements for the roofing system and the coordinating and scheduling required with related work. They shall also inspect the roof surfaces at the following times:

1. Prior to the start of the roofing installation as noted under Section 3.01 A. where required by the manufacturer to validate his warranty.

2. At the actual start of the roofing application.

3. Once during the roofing application.

4. At job completion.

Note: It shall be the responsibility of the Contractor to notify the Roofer, Manufacturer's Representative or their independent roofing auditor/inspector (where applicable) and the Engineer of his schedule of operations. Parties shall be notified at least 5 days in advance to enable their attendance.

Change number to suit magnitude and complexity of your project. A minimum of One inspection is required during the roofing application for roofs < 7,000 s.f. with no unusual penetrations and with no A.C. equipment.

1.04 DRAWINGS

A. Should the Manufacturer's warranty requirements necessitate different drawing and details exceeding the requirements of those shown or specified, provide shop drawings and field adjustments at no cost to the State.

1.05 SUBMITTALS

A. The contractor shall submit the following to the Engineer:

1. Prior to the start of any work, a signed certificate from the proposed roofing manufacturer showing that the roofer is a trained and authorized applicator of his assemblies.

NOTES TO ARCHITECT

2. A signed certificate from the proposed roofing manufacturer naming their representative and their independent roofing auditor/inspector (where applicable) and showing that he is authorized to act on and make commitments in their behalf.

3. 5 complete sets of the following information for the roofing system he proposes to use. Submittals shall be marked-up as necessary to clearly identify the items being submitted and its conformance to the requirements of these specification:

   a. Manufacturer's material product data and Material Safety Data Sheets for the following items:

      1. Insulation.
      2. Insulation Fasteners.
      3. Wood Fiber Board.
      4. Dry Sheet.
      5. Base Sheet.
      6. Combination Base Sheet & Dry Sheet.
      7. Venting Medium.
      8. Ply Sheets.
      9. Cap Sheet.
      10. Base Flashing System.
      11. Walk-on Pads.
      12. Cant Strip.
      13. Roofing vent.
      14. Asphalt.
      15. Flashing Cement.
      16. Neoprene Flashing Cement.
      17. Insulation Adhesive.
      18. Emulsion and Coatings.

   Delete references to any and all materials which are not applicable to your job.

   b. Detailed installation drawings and specifications for the proposed roofing system/assembly. The installation drawings shall indicate the layout of insulation and the location of mechanical fasteners.

   c. Test report from a qualified testing laboratory indicating that the proposed roofing system has a fire classification rating of either Class A or Class B. The test report shall

   Delete reference to insulation when it is not used.

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also indicate the maximum roof slope permitted for the proposed assembly.

d. Where required, Factory Mutual approval for the proposed roofing system.

All materials except the insulation, emulsions, coatings and the venting medium when it is under insulation and is therefore not an integral part of the roofing membrane shall be as labeled or approved by one manufacturer.

4. Detailed roofing inspection reports by the Manufacturer's Representative or their independent roofing auditor/inspector (once during the roof application and one at job completion.

Insert number of inspections as applicable. (See Section 1.03 E.3.)

5. Warranties and Guaranties as noted under Section 1.06.

1.06 GUARANTY

A. The Contractor shall furnish to the Engineer a written guaranty on the roofing membrane system and base flashing for a 2-year period after the Project Acceptance Date. The guaranty shall provide the following at no cost to the State:

Be sure to require a 2-year quaranty on sheet metal counterflashing and sealing in your SHEET METAL Section.

1. Repair of roofing and flashing as necessary to seal leaks which are attributable to faulty materials and/or workmanship;

2. Repair or replacement of damage to the building and/or its finishes, equipment and/or furniture when occasioned by such leaks; and

3. Inspection of the roofing and flashings together with the Engineer or his designated representative, on or about the 1st and 2nd anniversaries of the Project Acceptance Date, and repair or replacement of the roofing and/or flashings as necessary to correct any deficiencies in workmanship or materials, such as by eliminating blisters exceeding 12" in any dimension or re-adhering felts or cap sheets which have separated at the joints

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to a depth of one inch or more from the edge. Such repair or replacement of roofing and/or flashing shall be done in a manner which will preserve the integrity of the roofing membrane.

1.07 PRODUCT HANDLING

A. Delivery of Materials: All roofing materials shall be delivered to the site in the original unbroken manufacturer's wrapping material and containers with the original labels thereon intact. If any bulk or unlabeled materials are to be used, a properly attested certificate from the manufacturer stating that such materials comply with the requirements of the Contract Documents shall be furnished to the Engineer prior to installation.

B. Storage of Materials at Job Site

1. Except when placed on roof decks immediately prior to installation, roofing materials shall be stored above the supporting surfaces, such as on pallets.

2. Roll goods, insulation, and any other materials which either absorb or are adversely affected by moisture shall be kept dry. Wet materials and/or materials which appear to have been deteriorated after getting wet shall not be permitted to be used on the job and shall be removed promptly.

Delete the word "insulation" when that material is not used.

3. Materials containing solvents shall be stored in a dry, cool area with proper fire and safety precautions.

4. Roll goods shall be stored on end.

5. If stored on other than the ground, all materials shall be distributed so that their resultant weight does not exceed the design live load on the deck (normally 20 lbs. per square foot on roofs and 40 lbs. per square foot on floors).

PART 2 - PRODUCTS

2.01 MATERIALS

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A. Asbestos Prohibition: No asbestos containing materials or equipment shall be used under this section. The Contractor shall ensure that all materials and equipment incorporated in the project are asbestos-free.

Delete references to any and all materials which are not applicable to your job.

B. General: Each package of built-up roof covering materials shall bear the label of a recognized agency having a service for the inspection of material and finished products during manufacture (e.g., ASTM, UL, etc.).

C. Asphalt: Standard brand complying with ASTM D312 Types III or IV, or modified roofing asphalt with its softening point (SP), flash point (FP) and equiviscous temp. (EVT) clearly marked on each package.

D. Asphalt Primer: Standard brand complying with ASTM D41.

E. Roof Insulation: Standard brand complying with the following:

1. Mineral Fiber Insulation Board complying with ASTM C726.

Delete this paragraph if insulation is not used.

2. Mineral Aggregate (Perlite) Thermal insulation Board complying with ASTM C728.

3. Faced Polyisocyanurate Insulation Board complying with Federal Specifications HH-I-1972 (polyisocyanurate only, polyurethane not permitted).

Be sure that insulation specified on metal decks will span flute-to-flute clear span.

Insulation shall have a minimum thermal resistance (R factor) of _____ btu/hr./sq/ft.

Specify thermal resistance when required. If not, delete sentence.

F. Roof insulation for slope build-up: Uniform thickness and tapered insulation of the types in Subsection 2.01 E above. May also be pre-tapered EPS (expanded polystyrene) conforming to ASTM C578, Type I, nominal density of 1.0 lb./cubic foot.

Delete this paragraph if slope build-up is not part of the project scope. Specify thickness if it is critical to detailing. Add Notes on appropriate plan

1. Over non-combustible decks, unless otherwise required by the testing laboratory's report for a fire rated assembly, the EPS insulation shall be

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faced in the field with a minimum of 1/2" thick perlite insulation board or wood fiberboard. The maximum roof slope where a mineral surfaced cap sheet is provided is 1 inch per foot.

details: "Insulation thickness assumed for plan detail is ____ inches. Required changes shall be coordinated if actual thickness is other than as shown."

2. Over combustible decks, a thermal barrier board and/or facing board as required by the testing laboratory's report for a fire rated system shall be provided over the EPS insulation.

NOTE: If the Contractor elects to use insulation with a thickness other than that shown on the plans, he shall be responsible to prepare any revised detail drawings and to coordinate with other trades as may become necessary because of the thickness change. Any additional costs to implement such a change shall be borne by the Contractor.

NOTE: Where the testing laboratory's report permits the use of ESHAVENT venting medium directly over EPS insulation (without a thermal barrier or facing board), the EPS shall have a minimum density of 1.25 lbs. / cubic foot.

G. Roof Insulation Tape: Minimum 6" wide fiberglass roof insulation tape.

H. Wood Fiberboard: Standard brand complying with ASTM C208, asphalt coated on six sides and compatible with the insulation and roofing system as per the manufacturer's recommendations.

Delete when insulation is not used.

Delete when insulation is not used.

I. Cant Strip: Mineral fiber or perlite, compatible with the insulation and the roofing system. Cants shall be a minimum of 4 inches high with an exposed face at 45 degrees to the plane of the roof.

J. Mechanical Fasteners For Insulation: Manufactured products of the appropriate type and length for the proposed roof deck and insulation installation as recommended by the

Delete when insulation

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insulation manufacturer and approved by Factory Mutual as a component of the roofing system.

is not used.

K. Roof Insulation Adhesive: Adhesive shall be asbestos free, waterproof (non-reemulsifying) and compatible with the insulation and substrate as recommended by the roof insulation manufacturer. Adhesive shall also be approved by Factory Mutual as a component of the roofing system.

Delete when insulation is not used.

L. Roofing Nails: Galvanized, of the appropriate type and length for the proposed installation as recommended by the roofing membrane manufacturer.

M. Plastic Cement: Standard brand, asbestos free, as recommended by the roof membrane manufacturer.

N. Neoprene Flashing Cement: Standard brand, asbestos-free, as recommended by the roof membrane manufacturer.

O. Emulsions and Coatings:

1. Emulsion shall be asbestos free and compatible with the finish coating as recommended by the roof membrane and roof coating manufacturer.

2. Color Coating shall be as recommended by the roof membrane manufacturer, asbestos-free, and approved as part of the proposed fire rated roof membrane assembly by a qualified testing laboratory. Color shall be _____.

Delete this Sub-Section when colored or reflective coating is not desired as a finish.

3. Reflective Coating shall be an asphalt-based, asbestos free, fibrated aluminum roof coating as recommended by the roof membrane manufacturer and approved as part of the fire rated roof membrane assembly by a qualified testing laboratory.

Delete when only reflective coating is to be used.

Specify color.

P. Gravel Surfacing: Roofing chips meeting the requirements of ASTM C33, Size No. 8, and free of loose dust. Coral chips shall not be used.

Delete when only color coating is to be used.

Q. Dry Sheet: Rosin-sized paper weighing not less than 4#/100 s.f., unsaturated felt weighing 7-1/2#/100 s.f., or roof sheathing paper weighing approximately 6#/100 s.f.

R. Base Sheet: Asphalt coated glass fiber base

Use gravel surfacing

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sheet as recommended by the roof membrane manufacturer and complying with ASTM D4601, Type I.

only when directed by Central Services on reroofing projects where roof slope is inadequate to drain. Delete on new projects or when smooth or mineral surfaced finish is used.

S. Combination Base Sheet / Dry Sheet: Asphalt coated base sheet with laminated kraft paper backing conforming to ASTM D4601, Type I.

T. Venting Medium:

Delete paragraphs "Q" and "S" when deck is other than wood.

1. Special venting sheets, such as Ventsulation by Johns-Manville, Channel Vent GB Base Sheet by Celotex Corp., Stratavent by GAF Corp. and "ESHAvent" by Malarkey Roofing Company.

   Insul Base by Intec/Permaglas may be used only on top of insulation on an insulated deck with a single layer of insulation.

Delete when venting medium is not used.

Use over all decks of concrete, lightweight concrete, and nailable concrete fills such as perlite, vermiculite, gypsum or cellular concrete.

2. Mineral-surfaced cap sheet installed with granules down.

3. Glass fiber insulation.

U. Ply Felts/Sheets: Asphalt impregnated sheets reinforced with inorganic fibers and conforming to ASTM D2178, Type IV (Heavy Duty Ply Sheet).

V. Mineral Cap Sheet: Asphalt impregnated and coated sheets reinforced with inorganic fibers, uniformly surfaced on one face with inorganic mineral granules firmly embedded into the asphaltic coating and conforming to ASTM D3909. Color of finish shall be _____.

W. Torch-on Modified Bitumen Base Flashing: Flashing material shall be manufactured with atactic- polypropylene (APP) or styrene-butadiene-styrene (SBS) polymers and reinforced with inorganic fiber. Nominal thickness of the material shall be 160 mil (4.0 mm). Where two layers of flashing are required, the bottom layer shall be smooth surfaced. The finish of the surface layer shall match the adjacent roof surface.

Delete this paragraph when smooth or gravel surfaced finish is used.

Specify color.

X. Walk-on Pads: Composed of chopped rubber particles and synthetic binders. Pads shall be cut from rolls nominal 0.321 inch (8mm) thick x 31.5 inches (80 cm) wide x 32.8 feet (10 m) long. Pads shall be "Trafblock Walk Pad" as

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manufactured by Siplast or approved equal. Adhesive for pad application shall be compatible rubber based adhesives approved by the roofing membrane manufacturer. Finish surface of the pad shall match the adjacent roof surface.

Delete when walk-on pades are not used.

Y. Roofing Vent: Manufactured plastic assembly at least 6 inches high with minimum 2-inch base diameter vent stack and 10-inch diameter base flange. As an option, the vent assembly may be of copper meeting the above minimum dimensions.

Z. Termination Bar: 1" x 1" x 1/8" thick galvanized steel angle with slotted holes at 8" o.c. or approved equal.

This description is for a 2-way vent. Be sure to modity description if 1-way or solor vent is required.

Delete when termination bar is not used.

2.02 BUILT-UP ROOFING ASSEMBLIES

A. General Requirements:

1. In accordance with the Uniform Building Code, the roof covering assembly shall have a fire classification rating of either Class A or Class B when tested in accordance with U.B.C. Standard 32-7 or as otherwise tested and rated as either Class A or B by a qualified testing laboratory (Underwriters Laboratories (UL), Warnock Hersey, Factory Mutual (FM) or approved equal).

2. Roofing materials shall conform to Federal and/or ASTM specifications as indicated.

B. Built-up Roofing Assemblies

1. Roof insulation as called for in sub-paragraph 2.01 E. and F. above shall be installed as described herein where shown on the plans.

Delete this paragraph when insulation is not used.

2. Roofing membrane system shall consist of at least three solid layers of asphalt contained between the top felt or cap sheet and the roof deck, base sheet or

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insulation, as the case may be. (The flood coat into which aggregate is broadcast for gravel-surfaced roofing, the emulsion over smooth-surfaced roofing and the asphalt used to adhere insulation to the venting medium over a concrete or nailable concrete fill deck shall not be considered as one of the required layers.) Asphalt above the top felt or cap sheet, or below the insulation where such is used, shall not count as one of the required layers.

Delete references to materials such as gravel, emulsion, insulation, etc. when they are not used.

3. Roof and Base Flashings:

a. Flashings shall consist of either hot-mopped asphalt, 2 roofing plies and a mineral-surfaced cap sheet (granule-side up) or 1 or 2 layers of a modified bitumen base flashing, as specified in sub-paragraph 2.01 W. installed in accordance with plan details.

Each layer of modified bitumen flashing shall be torched-on (heat-welded) onto the substrate in accordance with the manufacturer's instructions.

b. Flashings shall be secured to the vertical surfaces using appropriate type fasteners through tin caps at 8 inches o.c. along its top edge or where otherwise shown on plan details.

c. See paragraph 3.04 for minimum flashing over metal flanges, edging etc.

PART 3 - EXECUTION

3.01 INSPECTION OF SURFACES

A. Before the work under this section is started, the Roofer, together with the Manufacturer's Representative or their independent roofing auditor/inspector (where applicable) and the Contractor shall meet with the Engineer at the job-site to examine all surfaces on which

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roofing will be placed and all adjoining work, including inserts, which will affect or be affected by the roofing work. All unacceptable areas and/or conditions such as those listed in subparagraph 3.02 A.5 shall be corrected by the contractor and verified and accepted by the Roofer and the Manufacturer's Representative or their roofing auditor/inspector prior to start of the work.

Include other related trades in the inspection group if/as applicable to your job (e.g. the sheet metal subcontractor where there are embedded reglets in parapet walls, etc.)

B. Before the work under this section is started, the Contractor and Engineer shall inspect and record the conditions of the building interior rooms and ceilings. The Contractor shall protect the interior finishes, furniture and equipment against damage.

3.02 APPLICATION

Delete this paragraph for new construction projects.

A. General

1. Workmanship: The Roofer shall have a responsible foreman on the job during roofing operations who shall ensure that all work is done in accordance with the plans and specifications.

2. No roofing shall be installed during precipitation and shall not be started in the event there is a possibility of precipitation during application.

3. No roofing shall be started in the absence of the Engineer or his representative. The Contractor shall call the Engineer to give at least one day (24 hours minimum) advance notice of the starting of roofing operations.

4. The application of roofing shall be as specified or as shown in the plans.

5. Absolutely no roofing shall be applied before the deck and the work in connection therewith have met the following conditions:

   a. Wood decks shall be dry (moisture content 19% or less as measured on the Moisture Meter's Wood Scale); smooth;

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free from loose materials; properly graded to outlets; and swept clean. Knot holes or loose knots over one inch in dia. and cracks over 3/8" wide shall be covered with 24-gauge galvanized sheet metal nailed in place.

Delete paragraphs for decking which are not applicable to your job.

b. Concrete decks shall be cured (minimum 7 days) and dry (a test spot pour of hot bitumen shall not froth, bubble or be removable by hand after cooling), smooth, free from loose materials, properly graded to outlets, and swept clean. All sharp projections and lumpy places shall have been removed.

c. Concrete fill shall be tested for adequate holding power before roofing is started. A fastener of the type specified herein for the fill material used shall be driven and pulled out. No roofing shall commence until a minimum resistance of 50 pounds has been attained.

d. Sheet metal panels for insulated steel decks shall be so secured to supporting framework and to each other, and shall be in such condition, that insulation will bear on each rib and not have to bridge over deck discontinuities.

e. Adjoining work, such as roof drains, metal edging, metal counterflashing, gutters and lead collars for vent pipes shall either be in place, ready for the Roofer to work in, or shall be available for installation by others, as applicable. This work shall be coordinated so that the total roofing system will be watertight.

6. The temperature of the asphalt shall be monitored through the use of either accurate temperature gauges attached to the kettles or separate asphalt thermometers which shall be part of the Roofer's equipment. Asphalt shall be heated to no higher than 50°F below its flashpoint (FP), nor heated and held above its finished blowing temp. (FBT) for more

than four hours. It shall also be applied at its equiviscous temperature (EVT) range (EVT +/- 25oF).

7. The elapsed time between the application of hot asphalt on the deck and the laying and brooming in of felt, insulation, or cap sheet shall be minimized to insure full bonding between the surfaces being cemented together with the asphalt. It shall be the Roofer's responsibility to modify his operations to accomplish this considering the ambient conditions of weather, temperature, etc. A felt laying machine shall be used if necessary.

8. Felts shall be bonded to one another using a solid mopping of 25 lbs. of hot asphalt per square (30 lbs. for glass fiber felts). In solid mopping, asphalt shall be distributed evenly, covering each layer 100% so that felt does not touch felt in any place. This means that asphalt shall be carried to the outer edges of shingled felts and flashing strips.

9. Roofing felt shall be applied smoothly and squeegeed into the hot asphalt to eliminate air pockets and assure total contact with the layer below. Also, there shall be no stepping onto the membrane behind the applicator until the asphalt has cooled and hardened.

Felts may be laid with any felt laying machine other than the rotary drum type, except that automatic asphalt spreaders shall not be used where dock slopes are so steep that "runaway" flow occurs.

10. Laying of felts (lapping or shingling) shall be in accordance with the manufacturer's specifications. Unless otherwise specified therein, end laps shall be 4 inches and staggered not less than 12 in. apart.

11. Before application of the cap sheet, build-up all "bird-baths" by mopping in place with hot asphalt one (1) or more

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layers of felt to provide positive drainage.

12. Mineral-surfaced cap sheets and coated felts weighing more than 45 lbs. per square shall be cut into lengths not less than 6 feet and not more than 12 feet and allowed to flatten before being laid. They shall be cut and laid so that their side laps do not "stack up" over the side laps of any of the roofing layers below. Each strip shall be laid, then broomed or rolled into a solid mopping of 25 lbs. of hot asphalt per square in any manner that will best eliminate air pockets and assure total contact with the membrane below. Laps for mineral-surfaced cap sheets shall be 2 inches on sides and 6 inches on ends. That for coated felts shall be 2 inches on sides and 4 inches on ends. End laps shall be staggered not less than 3 ft. apart in adjacent strips. There shall be no stepping onto the membrane behind the applicator until the asphalt has cooled & hardened.

For re-roofing projects, show location of bird-baths/ponding areas on the plans and address correction.

Delete this paragraph when smooth or gravel surface finish is used.

13. Where a mineral surfaced cap sheet is used, loose ceramic granules of matching color with the cap sheet shall be broadcast over excess bitumen seepage, spillage, etc., while the bitumen is still liquid in order to provide a neat and uniform finish similar to that of the surfacing sheet. Excess bitumen seepage shall be considered bitumen flowing out past the edge of the cap sheet more than 3/8".

Delete this paragraph when smooth or gravel surface finish is used.

14. For gravel surfaced roofs, not less than 400 lbs. per square of roofing chips shall be embedded in a flood coat (minimum 60 lbs. per square) of hot asphalt.

15. Phased construction (roofing purposely interrupted for a period to permit other work and trafficking over the membrane) shall not be permitted.

Delete when gravel surface finish is not used.

a. The complete roofing membrane, including emulsion surfacing in the case of smooth-surfaced roofing, shall be installed up to the line of termination (but allowing for required lapping) at the end of the day's work.

b. At the end of the day's work, all

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incomplete roofing shall be protected using a water cut-off. The water cut-off shall consist of coated felt strips set in plastic cement and lapping both the finished membrane and the roof deck surface in such a manner as to seal all incomplete edges against intrusion of water.

c. Water cut-off shall be removed before continuing installation of the roofing system.

B. Insulation

1. General

a. The application of insulation shall be as specified herein or as shown in the plans unless otherwise stipulated in the specifications and details of the manufacturer of the insulation being used, as submitted to and approved by the Engineer.

Delete this sub-section in its entirety if insulation is not used.

b. Units of insulation shall be laid with their long joints perpendicular to the direction of laying of the roofing plies.

c. Units of insulation shall be laid so that they touch adjacent units along all sides.

d. Where mineral fiber, mineral aggregate or isocyanurate insulation is applied in more than one layer, depending on the substrate, the first layer shall be mechanically fastened to the deck or hot-mopped onto the base sheet or venting medium. In either case, every layer thereafter shall be solid mopped with asphalt.

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e. Unless otherwise indicated, where EPS insulation is used, it shall be laid into a solid mopping of hot asphalt that has been allowed to cool to approximately 225o to 250o F. or shall be adhered to the substrate using waterproof (non-emulsifying) adhesive in accordance with the manufacturer's recommendations.

Delete this paragraph when EPS insulation is not used.

f. If premanufactured, multi-layered EPS insulation is used for building up slopes or crickets, it shall be bonded together with waterproof (non-emulsifying) adhesive covering 100% of the bonded surfaces.

g. When insulation joints are not taped, the short joints shall be staggered.

Delete this paragraph when EPS insulation is not used.

h. When taped, insulation joints may be continuous in both directions. Tape shall be centered on the joint and embedded in hot asphalt applied at a rate of 15 lbs. per square.

i. All joints in EPS insulation shall be tightly butted together. Joints of the field applied facing boards shall be tightly butted together, staggered, offset from the insulation joints below and taped with roof insulation tape. Care shall be taken in applying hot asphalt above the insulation so that it does not contact insulation already in place.

Delete this paragraph when EPS insulation is not used.

2. Acceptability

a. Insulation which shows signs of deterioration (such as reduced resistance to delamination, edge disintegration, etc.) shall not be used.

b. Insulation which has been installed but is still exposed shall be covered immediately when there is any danger that it will get wet.

c. Installed insulation which gets wet shall be handled as follows before any

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roofing is applied over it:

(1) All insulation shall be completely dried out as determined by a moisture meter.

(2) Glass fiber insulation which gets waterlogged after installation shall be removed and replaced with dry material.

(3) The exposed portions of perlite aggregate insulation board shall be broomed lightly to remove any surface "skin" degradation that may have formed due to wetting. Boards that are gouged or broken in the process shall be removed and replaced.

(4) The location of a joint between perlite aggregate insulation units shall be so marked in the vicinity of the center of the wetted area that an additional roofing vent can be installed directly over it after completion of the roofing membrane.

d. Insulation units with broken corners or similar defects shall be trimmed and repaired (gap filled with similar material) or discarded.

e. Any EPS insulation which is damaged because it is subjected to excessive heat shall be removed and replaced with properly installed units.

Delete this paragraph when EPS insulation is not used.

C. Installation

1. On wood and plwood decks:

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a. Dry sheet shall be lapped 2 inches on sides and ends and sprinkle-nailed to the deck. A coated base sheet with minimum 2-inch side laps and 6-inch end laps shall be laid over the dry sheet and nailed 9 inches o.c. along all laps and 18 inches o.c. and staggered along lines 12 inches in from each edge. Both sheets may be nailed jointly provided their laps are staggered. Where the roof slope is greater than 1-1/2" per foot, the base sheet shall be laid in the direction of the slope and extended over the ridge where possible.

In high wind areas and open areas subject to high wind conditions, require nailing of insulation in the number and pattern similar to that required for an FM approved I-90 installation along with additional nailing of the base sheet in the outer 4' of the building perimeter. Verify with your project coordinator if your project is in this category.

b. If available, a combination dry sheet/base sheet may be used in lieu of the individual plies of dry sheet and base sheet. The combination sheet shall be nailed as described above for the base sheet.

c. The roofing membrane shall be laid onto the coated base sheet or combination base sheet in a solid mopping of hot asphalt.

d. Mineral fiber and mineral aggregate insulation shall be hot-mopped to the base sheet in a solid mopping of 30 lbs. per square of hot asphalt. The roofing membrane shall then be laid over the insulation in a solid mopping of asphalt.

Delete paragraph when insulation is used.

Delete paragraphs "d", "e" and "f" where insulation is note used.

(1) As an alternative, the insulation may be mechanically attached directly to the deck using screw fasteners in the number and pattern recommended by the roof insulation manufacturer. No dry sheet will be required when this alternative is used.

e. Where used, polyisocyanurate

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insulation shall be fastened to the deck as noted in item (1) above. A venting base sheet or coated base sheet shall be spot-mopped onto the insulation and the roofing membrane shall then be laid onto the venting sheet in a solid mopping of hot asphalt.

f. Where EPS insulation is used for slope build-up, barrier boards placed atop the deck and/or facing boards placed atop the EPS insulation as noted under Subsection 2.01 F. shall be provided as necessary to conform to the requirements for a fire rated assembly and installed in accordance with the insulation manufacturer's recommendations. Where barrier boards are provided, provision of the dry sheet and base sheet may be deleted. The roofing membrane shall be laid onto the facing boards in a solid mopping of hot asphalt.

Delete this paragraph when EPS insulation is not used.

2. On nailable concrete fill decks (perlite, vermiculite, gypsum or cellular concrete).

a. Venting medium shall be cut into lengths not to exceed 18 ft. and allowed to relax and flatten before laying.

b. The venting sheets shall then be laid over the deck with side laps equal to the selvage (2 inches if none) and end laps of 4 in. staggered at least 12 in. between adjacent strips.

c. Finally, the sheets shall be nailed to the deck using mechanical fasteners appropriate to the deck material in the number and pattern recommended by the roof membrane manufacturer. Fasteners shall be located so that they do not coincide with roof vent locations.

d. The roofing membrane shall be laid onto the venting medium in a solid mopping of hot asphalt.

Delete this paragraph when insulation is used.

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e. Mineral fiber and mineral aggregate insulation shall be hot-mopped to the venting medium in a solid mopping of 30 lbs. of asphalt per square. The roofing membrane shall be laid over the insulation in a solid mopping of hot asphalt.

Delete paragraphs "e", "f", "g" and "h" when insulation is not used.

f. If mineral fiber insulation is used for venting in lieu of the venting medium noted above, it shall be mechanically fastened to the deck using screw fasteners in the number and pattern recommended by the roof insulation manufacturer. Fasteners shall be located so that they do not coincide with roofing vent locations. The roofing membrane shall be laid onto the insulation in a solid mopping of hot asphalt.

g. Where used, polyisocyanurate insulation shall be hot-mopped to the venting medium in a solid mopping of 30 lbs. of asphalt per square. A venting base sheet or coated base sheet shall be spot-mopped onto the insulation and the roofing membrane shall then be laid onto the venting sheet in a solid mopping of hot asphalt.

h. Where used for slope build-up, EPS insulation and facing boards as described under Sub-section 2.01 F. shall be placed onto the venting medium as described under Sub-section 3.02 B.1.e. The roofing membrane shall then be laid onto the facing material in a solid mopping of hot asphalt.

Delete this paragraph when EPS insulation is not used.

3. On concrete decks.

a. When the deck is dry enough to receive roofing (see subparagraph 3.02 A.5.b.), it shall be primed with asphalt primer applied at a rate of one gallon per 100 square feet.

See Tech Memo No. 47 for reroofing projects. re: Deletion of asphalt primer.
Delete paragraph is not applicable to your

NOTES TO ARCHITECT

project.

b. After being cut and relaxed as described in subparagraph 3.02 C.2. above, the venting sheets shall be spot-mopped to the deck using a minimum of 12 lbs. per square of asphalt. The spots shall be approximately 12 inches in diameter, spaced 18 inches o.c. and staggered, and shall be carefully mopped so that no asphalt is dripped between spots. They shall be located so that they do not cover or encroach into roofing vent locations.

   The venting sheets shall be laid with side laps equal to the selvage (2 inches if none) and end laps of 4 inches staggered at least 12 inches between adjacent strips. Special perforated venting sheets when used shall be installed in accordance with the manufacturer's instructions.

c. The roofing membrane shall be laid onto the venting medium in a solid mopping of hot asphalt.

d. Mineral fiber and mineral aggregate insulation shall be hot-mopped to the venting medium in a solid mopping of 30 lbs. of asphalt per square. The roofing membrane shall be laid over the insulation in a solid mopping of hot asphalt.

Delete this paragraph where insulation is used.

e. If mineral fiber insulation is used for venting in lieu of the venting medium noted above, it shall be spot-mopped to the deck at a rate of 12-16 lbs. of asphalt per square. The roofing membrane shall be laid onto the insulation in a solid mopping of hot asphalt.

Delete paragraphs "d", "e", "f" and "g" where insulation is not used.

f. Where used, polyisocyanurate insulation shall be hot-mopped to the venting medium in a solid mopping of 30 lbs. of asphalt per square. A venting base sheet or coated base sheet shall be spot-mopped onto the insulation and the roofing membrane shall then be laid onto the venting sheet in a solid mopping of hot

asphalt.

g. Where used for slope build-up, EPS insulation and facing boards as described under Sub-section 2.01 F. shall be placed onto the venting medium as described under Sub-section 3.02 B.1.e. The roofing membrane shall then be laid onto the facing material in a solid mopping of hot asphalt.

Delete this paragraph when EPS insulation is not used.

4. On steel decks

a. Insulation shall be laid so that edges parallel to flutes bear on the deck flange surfaces. Joints shall not terminate unsupported over rib openings.

b. The insulation shall be fastened to the deck using mechanical fasteners as described under Subsection 2.01 J. in the numbers and patterns required for a Factory Mutual approved Class 1, I-90 installation.

c. Where mineral fiber or mineral aggregate insulation is used, the roofing membrane shall be laid onto the insulation in a solid mopping of hot asphalt. Where polyisocyanurate insulation is used, a venting base sheet or coated base sheet shall be spot-mopped onto the insulation and the roofing membrane shall then be laid onto the venting sheet in a solid mopping of hot asphalt.

d. Where EPS insulation is used to provide slope build-up, a thermal barrier shall first be fastened to the metal deck using mechanical fasteners as described in Subsection 2.01 J. The thermal barrier, insulation and facing boards shall be installed as required so that the total assembly conforms to a Factory Mutual approved Class 1, I-90 installation. The roofing membrane shall be laid onto the facing boards in a solid mopping of hot asphalt.

Delete this paragraph when EPS insulation is not used.

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D. Cant Strips.

1. Install cant strips at the intersections with curbs, walls and parapets. They shall be continuous, installed in lengths as long as possible and set in a heavy mopping of asphalt.

E. Roof and Base Flashings.

1. Prior to the application of roof and base flashings, the substrate shall be primed with asphalt primer to ensure proper adhesion of the flashing material.

2. Base flashings shall be secured to the vertical surfaces using appropriate type fasteners, suitable for the substrate condition, through tin caps spaced at 8 inches o.c. along its top edge, unless otherwise shown on the plans.

3. Where a termination bar is called for, it shall be secured to the vertical surface using appropriate type fasteners suitable for the substrate condition through the slotted holes in the bar spaced at 8 inches o.c. Fasteners shall be set in a bead of flashing cement. A cant of flashing cement sloped to the outside edge of the bar shall be formed atop the termination bar.

Delete this paragraph when termination bars are not used.

4. See Subsection 3.04 for minimum flashing requirements over metal flanges, edging, etc.

Show detail on plans. Refer to DAGS Std. Detail No. R-3 and R-4a dated 7/91.

5. New roofing which adjoins existing roofing shall be flashed as shown in the plans.

F. Gravel Surfacing.

1. Not less than 400 lbs. per square of roofing chips shall be embedded in a flood coat (minimum 60 lbs. per square) of hot asphalt for gravel-surfaced roofing.

Show detail on plans. Refer to DAGS Std.

NOTES TO ARCHITECT

Detail No. R-16 dated 9/91.

Delete this paragraph when gravel surfacing is not used.

G. Emulsions and Coatings.

1. Emulsion surfacing shall be applied by brushing or rolling and shall be thoroughly cured before color or reflective coating is applied. The minimum curing time shall be as recommended by the manufacturer of the coating, but in any case shall extend until the material does not come off when walked upon, water does not "bead" on its surface and it does not bleed or discolor the color or reflective coating.

Delete this paragraph where emulsion and coating finish is not used.

2. Coating finish shall be applied in strict accordance with the manufacturer's recommendations and instructions. In addition, they shall be applied in the quantities and rates noted on the tesitng laboratory's report as required to provide a fire rated assembly.

H. Walk-on Pads.

1. Pads shall be cut to size and installed with a compatible rubber based adhesive approved by the roofing system manufacturer.

3.03 INSPECTION - FIELD SAMPLES OR CUTOUTS

A. After completion of the specified roofing plies, but prior to the application of the final pour coat and the cap sheet (for mineral-surfaced cap sheet assemblies), or after installation of all roofing but the emulsion coating (for smooth-surfaced assemblies), field samples of the roofing shall be taken at locations selected by the Engineer. The sampling operation shall be performed by the Roofer at no expense to the State and in the presence of the Engineer. The Roofer shall provide all equipment required.

Delete this paragraph when walk-on pads are not used.

Delete type of roofing finish not applicable to your project.

B. Sampling Requirements: Samples shall be 4 inches x 36 inches cut across the laps of the plies in a manner to expose the specified number of plies

NOTES TO ARCHITECT

and shall be cut to an accurate template (a template may be of a type for self-cutting). Not less than 2 samples shall be cut from the roof for each 100 squares or fraction thereof. This requirement may be increased at the request of the Engineer if he deems it necessary.

C. The samples shall be examined for free water between the plies, the quantity of bitumen used, the adhesive strength of interply moppings, the completeness of interply bonding and the number of plies. They shall then be weighed to determine the total amount of bitumen. The test sample shall not weigh less than 90% of the weight of one square foot of the applicable roof (less the parts of the assemblies as described above) as indicated in the approved manufacturer's specifications.

D. Should the sample show free water, absence of bitumen or a deficiency in the amount of bitumen applied, additional samples shall be taken to determine the extent of the deficiency.

1. Where free water is found between plies, the affected portion of the roof shall be removed completely and reconstructed.

2. Where bitumen deficiencies or poor interply bonding conditions are found, the deficient areas shall have an additional specified ply applied in a full mopping of specified bitumen.

3. Where insulation is found to be wet and the roofing membrane is not adhering, the insulation and membrane over the affected area shall be removed and replaced.

4. Where insulation is found to be wet, but the roofing assembly is otherwise sound, provisions shall be made to permit the water vapor from the insulation to be vented.

Delete paragraphs "3" and "4" when insulation is not used.

5. Correction of any of the above deficiencies shall be made by the Roofer at no additional cost to the State.

6. Roofing shall not proceed until all

NOTES TO ARCHITECT

deficiencies (that may have been disclosed as the result of the "cut-out" test) have been corrected and approved.

E. Cutting edge of the sampling device shall be kept clean by washing in a suitable solvent after each cut.

F. Immediately after the sample has been examined and weighed, the "cut-out" area from which a satisfactory sample was taken shall be patched as follows:

1. For wooden decks, a dry sheet and a base sheet of the type cut shall be placed in the bottom of the cut-out and sprinkle-nailed. The base sheet shall be heavily coated with plastic cement and the previously removed sample shall be placed thereon and pressed firmly into the cement. The area shall then be covered with the same number and type of plies as was originally specified. These shall be hot-mopped in place with the first ply overlapping the cut-out area 6 inches on all sides and each succeeding ply overlapping the preceding ply 3 inches on all sides.

Delete paragraphs for decking which are not applicable to your job.

2. For concrete fill decks without insulation a venting sheet of the type cut shall be placed in the bottom of the cut-out and nailed to the deck near each end of the sample with the appropriate fastener. The venting sheet shall be heavily coated with plastic cement. The balance of the patching shall be identical to that for wooden decks as described above.

3. For concrete decks (or decks with insulation), the bottom of the cut-out shall be heavily coated with hot bitumen and the previously removed sample shall be placed thereon and pressed firmly into the bitumen. The area shall then be covered with the same number and type of plies as specified. These shall be hot-mopped in place, with the first ply overlapping the

NOTES TO ARCHITECT

cut-out area 6 inches on all sides and each succeeding ply overlapping the preceding ply 3 inches on all sides.

4. Where roofing over insulation is tested, bitumen shall be carefully separated from the insulation. Any damaged insulation shall be replaced in kind and in the same manner as originally installed.

Delete this paragraph when insulation is not used.

3.04 INSTALLATION OF ADJOINING WORK

A. All adjoining work (such as vent pipe flashings, roof vents, etc.) shall be as specified or as shown in the plans.

B. Where modified bitumen flashings are provided, neoprene flashing cement as specified in paragraph 2.01 N. shall be used.

C. Wood Blocking: Wood blocking shall be installed where shown on the plans and shall be secured to the deck with appropriate fasteners spaced at maximum 48 inches o.c.

Be sure to call for the furnishing of items of adjoining work in the appropriate specification sections. Delete paragraphs which are not applicable to your project or add paragraphs as required. Describe work in detail and show details on plans (e.g. Roof Scupper, Expansion Joint, Equipment Curbs and Mountings, etc.).

D. Metal Edging

1. On Mineral-Surfaced Cap Sheet System: Metal edging shall be set in a full bed of flashing cement on top of all roofing plies, not including the mineral-surfaced cap sheet. The edging shall be overlapped (nested, not cut) at least 5 inches at joints with a flexible non-hardening sealant which is compatible with the flashing cement and asphalt placed between the 2 layers of metal in such a manner that metal does not touch metal anywhere. The edging flange shall be securely fastened to edge nailing strips using large-headed nails at least 1-1/2" long. Nailing shall be 3 inches o.c. and staggered on either side of flange centerline. Laps shall be double nailed. The flange shall then be primed and flashed with either 2 strips of the specified roofing plies, one 3 inches

Delete type of roofing system not applicable to your project.

Show detail on plans. Refer to DAGS Std. Detail No. R-6a dated 7/91. If roof drains over edging, call for "0" lips. Use 3/8" height of lip for gravel

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wider than the flange and the second 3 inches wider than the first; or one layer of torched-on modified bitumen membrane 6 inches wider than the flange, as shown on the plans. The mineral-sufaced cap sheet shall then be laid in hot asphalt over the entire assembly with the edge 1/4" away from the outside corner of the metal edging. A continuous bead of flashing cement shall be applied and pressed into this edge.

surfaced roofing.

Provide closely spaced substantial anchorage of the face flange in high wind areas or areas exposed to high wind conditions. Continuous sheet metal clips with closely space fasteners or direct nailing of the face flange which closely spaced fasteners having neoprene washers are acceptable. Verify with your Project Coordinator if your project is in this category.

2. On Smooth/Gravel Surfaced System: All metal edging shall be set in a full bed of flashing cement on top of the completed roofing membrane. The edging shall be overlapped (nested, not cut) at least 5 inches at joints, with a flexible, non-hardening sealant which is compatible with the flashing cement and asphalt placed between the two layers of metal in such a manner that metal does not touch metal anywhere. The edging flange shall be securely fastened to edge nailing strips using large-headed nails at least 1-1/2" long. Nailing shall be 3 inches o.c. and staggered on either side of flange centerline. Laps shall be double nailed. The flange shall then be primed and flashed with either three strips of the specified roofing plies, the first 3 inches wider than the flange, the second 3 inches wider than the first, and the third 3 inches wider than the second; or one strip of torched-on modified bitumen membrane 6 inches wider than the flange, as shown of the plans. A continuous bead of flashing cement shall be applied and pressed into the gap between the edge of flashing plies and the outside edge of the metal flashing.

Show detail on plans. Refer to DAGS Std. Detail No. R-6 dated 7/91.

3. The face flange of the metal edging shall be anchored as shown in the plan details.

E. Lead Vent Pipe Flashing:

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1. Clean off rust from existing vent pipes and extend pipes to a minimum of 6 inches above the finished roofing system.

2. The top and bottom of the lead flashing flange shall be primed and set on top of the completed roofing membrane in a full bed of flashing cement. The flange shall then be flashed with a square piece of the specified roofing ply and one of the mineral-surfaced cap sheet, for a cap sheet system; of two square pieces of the specified roofing plies, for smooth-surface roofing; or of one layer of torch-on modified bitumen membrane with finish matching the adjacent surfacing.

Delete this sentence for new construction projects.

Show detail on plans. Refer to DAGS Std. Detail No. R-8 dated 7/91.

The bottom square shall have dimensions 6 inches more than the pipe flashing flanges and the top square (the cap sheet piece in a cap sheet system) or the modified bitumen flashing piece, 12 inches more. A hole about 1/8" larger than the pipe flashing shall be cut out of the center of the squares, which shall then be successively laid in hot asphalt over the flashing flange (except the modified bitumen piece shall be torched on). A cant of flashing cement shall be formed around the base of the pipe flashing collar after the top flashing square is in place.

3. Finally, the Roofer shall ensure that the lead flashing sleeve is turned down a minimum of one inch into and snugly against the interior surface of the vent pipe. A 1/8 inch mesh screen secured with a stainless steel clamp shall be installed over each vent pipe.

F. Roof Drain:

1. Clean the existing locking ring before tightly bolting it to the drain housing to ensure a watertight system.

2. Replace all broken or missing locking rings, bolts and strainers.

NOTES TO ARCHITECT

3. Install roofing membrane and lead flashing as indicated on the plans.

4. Clean all drainage channels through locking rings thoroughly after reroofing to ensure unimpeded flow of water into the drain.

Delete paragraphs "1" and "2" for new construction projects.

G. Roofing Vents:

1. Install roofing vents in locations indicated on the plans.

Show detail on plans. Refer to DAGS Std. Detail No. R-7 dated 9/91 or R-7a dated 7/91.

2. Cut a hole with diameter equal to that of the vent stack through the roofing system, including insulation, to the deck.

3. Prime top and bottom of the vent flange and set on top of the completed roofing membrane in a full bed of flashing cement. Complete flashing installation similar to lead vent pipe flashing.

Show location of roof vents and detail of vent on plans. Refer to DAGS Std. Detail No. R-12 dated 9/91 for detail and notes regarding vent location.

H. Temporarily remove electrical conduits, mechanical piping and equipment as necessary to clear the roof for installation of new roofing and reinstall upon completion.

I. Metal Counter-Flashing at Curbs and Parapets:

1. Existing reglet to remain: Completely remove existing sealant prior to installation of new work. Fill reglet as required in accordance with the roofing manufacturer's instructions.

Delete this paragraph for new construction projects.

2. Remove existing sheet metal work as necessary to allow for new sheet metal work.

3. Existing sheet metal work which is called to be re-used in the new work shall be carefully removed and properly stored.

Delete paragraphs "1" through "4" for new construction projects.

4. Remove existing cant strips and replace with new.

5. Sheet Metal Reglet: Reglets shall be installed where and as shown in the plans.

Show detail of flashing on plans. Refer to DAGS Std. Detail No. R-4 dated 9/91 and R-5 dated 7/91.

6. Metal counter-flashing shall be installed,

Be sure to specify

NOTES TO ARCHITECT

anchored and sealed as specified herein, as detailed in the plans or, if a manufactured system is used, as instructed by the manufacturer. Sealant material and application shall be as specified in the SHEET METAL Section.

appropriate sealant materials (e.g. polyurethane or Terpolymer sealants) and proper application procedures (e.g. cleaning and priming of existing surfaces) for sealing of counterflashing in SHEET METAL Section. Do not install metal reglets on horizontal surfaces or curbs.

J. Pitch Pocket: Sheet metal pitch pockets shall be installed around all poles, brackets, pipe support and other items which rest directly on or are attached to the roof deck. Pitch pocket pans shall have dimensions at least 2 inches larger than the dimensions of the poles, brackets, pipe supports, etc. They shall have flanges not less than 4 inches wide which shall be primed on the top and bottom and set on top of the completed roofing membrane in a full bed of flashing cement. The flange shall then be flashed with a strip of the specified roofing ply topped by a strip of the cap sheet, for a cap sheet system; two strips of the specified roofing plies, for smooth-surfaced roofing; or one layer of torched-on modified bitumen membrane with finish matching the adjacent surfacing.

Show detail on plans. Refer to DAGS Std. Detail No. R-9 and R-9a dated 9/91.

The flashing strips shall be set in hot asphalt (except the modified bitumen membrane shall be torched-on) with each strip wider than that below it by at least 6 inches (12 inches for modified bitumen flashing) and lapped full width at corners. A cant of flashing cement shall be applied to the exterior base of the pitch pocket. After the flashing plies have been installed, the bottom 1/3 depth of the pitch pocket pans shall be filled with flashing cement, and the balance filled with asphalt. After the asphalt has cooled and settled, the pitch pocket pans shall be topped-off using flashing cement and their tops shall be sloped to drain to the outside edges. Finally, a sheet metal skirt with dimensions adequate to extend at least 1 inch beyond the pan at its widest point and 1/2 inch below its top edge shall be fitted, sealed and clamped (or soldered) onto the poles, brackets, etc.

K. Sheet Metal Housing: Conduits, pipes, etc. (other than vent pipes) which penetrate the roof shall be routed laterally through sheet metal housings. The housings shall cover the openings

NOTES TO ARCHITECT

in the roof and have flanges at least 4 inches wide. The assemblies shall be emplaced and flashed similar to pitch pockets.

Show detail on plans. Refer to DAGS Std. Detail No. R-11 dated 9/91.

3.05 PROTECTION AND CLEANING

A. Protection

1. Any work or materials damaged during the handling of bitumens and roofing materials shall be restored to their original (undamaged) condition or replaced.

2. The work of other trades shall not be marred or injured. Asphalt daubed or splashed onto adjoining surfaces shall be removed and the surface or finish restored to its original finish and appearance. Asphalt runs, sags and streaks over sheet metal surfaces shall be carefully removed so as not to scratch those surfaces.

3. Protective coverings shall be installed at all pavement and exposed building walls adjacent to hoist, kettles, asphalt conveyor pipe, etc. prior to the start of work.

4. Protection shall remain in place for the duration of the roofing work.

B. Cleaning

1. Debris from roofing work shall be removed from the premises and disposed of at the end of each working day and upon completion of the work to the satisfaction of the Engineer. The roof shall be left in good, clean condition.

2. Bitumen shall be removed completely from all surfaces other than the bituminous roofing, especially those to which sealants must be bonded. Metal flashings other than those embedded in roofing surfaces shall not be mopped with asphalt.

3. Gutters, downspouts, roof drains, etc. shall be cleaned out and all blockages shall be removed prior to acceptance of

the project.

END OF SECTION